

WHAT IS CLAIMED IS:

1. A method of fabricating a semiconductor device including a crystallized active layer comprising the steps of:

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providing a substrate;

depositing an amorphous silicon layer on said substrate; and

heating said substrate while depositing a metal layer inducing low temperature crystallization of amorphous silicon on at least a portion of said amorphous silicon layer.

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2. The method according to Claim 1, wherein said metal layer includes at least one element among the group of Ni, Pd, Ti, Ag, Au, Al, Sn, Sb, Cu, Co, Cr, Mo, Tr, Ru, Rh, Cd and Pt.

3. The method according to Claim 1, wherein the substrate is heated at a temperature in a range of 200-700°C.

4. The method according to Claim 1, wherein said metal layer is deposited using at least one of sputtering, heating evaporation, PECVD and CVD.

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5. The method according to Claim 1, wherein the substrate is heated by using a heat conduction or a heat radiation method.

6. The method according to Claim 1, wherein a portion of said metal layer contacting with said amorphous silicon layer forms a metal silicide.

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7. The method according to Claim 6, wherein other portions of said metal layer remain in the state of metal and further comprising a step of removing the remaining metal layer by etching.

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8. The method according to Claim 1, wherein at least a portion of said amorphous silicon layer is crystallized by MIC during the process of heating the substrate while depositing the metal layer.

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9. The method according to Claim 1, further comprising a step of crystallizing said amorphous silicon layer by conducting a thermal treatment after depositing said metal layer.

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10. The method according to Claim 1, wherein the step of heating the substrate while depositing the metal layer comprises the steps of:

forming an insulation layer on said substrate and said amorphous silicon layer;
removing a portion of said insulation layer to expose a portion of said amorphous silicon layer; and

15 depositing said metal layer on the exposed surface of said amorphous silicon layer while heating said substrate.

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11. An apparatus for fabricating a semiconductor device including a crystallized active layer comprising:

a means for forming an amorphous silicon layer on a substrate; and

a means for depositing a metal layer inducing low temperature crystallization of amorphous silicon on at least a portion of said amorphous silicon layer while heating said substrate.

12. The apparatus according to Claim 11, wherein said metal layer includes at least one element among the group of Ni, Pd, Ti, Ag, Au, Al, Sn, Sb, Cu, Co, Cr, Mo, Tr, Ru, Rh, Cd and Pt.

13. The apparatus according to Claim 11, wherein said means for depositing a metal layer and heating the substrate heats the substrate at a temperature in a range of 200-700°C.

14. The apparatus according to Claim 11, wherein said metal layer is deposited using at least one of sputtering, heating evaporation, PECVD and CVD.

15. The apparatus according to Claim 11, wherein said means for depositing a metal layer and heating the substrate uses a heat conduction or a heat radiation method.